

REMARKS

Summary of the Office Action

The specification stands objected to.

Claim 1 stands rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

Claims 1 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Hara et al. of record.

Claims 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida et al. of record.

Summary of the Response to the Office Action

Applicants have amended claims 1 and 4 to more particularly point out and distinctly claim the subject matter which the Applicants regard as their invention. Claim 5 has been added. Claims 2 and 3 were previously cancelled without prejudice or disclaimer. Accordingly, claims 1, 4 and 5 are currently pending.

The Specification And Claims Comply With 35 U.S.C. § 112, first paragraph

Claim 1 stands rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Further the specification is objected to because of the same subject matter as the 35 U.S.C. § 112, first paragraph, rejection. By way of the foregoing amendment, claim 1 has been amended to recite that the smectic liquid crystal has spontaneous polarization in a range of $2\text{nC}/\text{cm}^2$ to $10\text{nC}/\text{cm}^2$ and a unit storage capacitance is in a range of $1\text{nF}/\text{cm}^2$ to $4.5\text{nF}/\text{cm}^2$, which the Examiner indicated at page 4 of the Office Action as being

supported by specification. Further, Applicant respectfully submits that paragraph [0036] supports the subject matter of this amendment. Accordingly, Applicants respectfully request that the 35 U.S.C. § 112, first paragraph, rejection be withdrawn. Further, Applicants respectfully submit that the foregoing amendment to claim 1 renders the objection to the specification moot. Thus, Applicants respectfully request that the objection to the specification be withdrawn.

All Claims Comply with 35 U.S.C. § 102

Claim 1 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Hara et al. of record. To the extent the Examiner considers the rejection to apply to the newly amended claim 1, it is traversed as being based on a reference that neither describes nor suggests the novel combination of features now recited in amended independent claim 1. For example, claim 1 now recites, amongst other features, that the smectic liquid crystal has spontaneous polarization in a range of $2\text{nC}/\text{cm}^2$ to $10\text{nC}/\text{cm}^2$ and a unit storage capacitance in a range of $1\text{nF}/\text{cm}^2$ to $4.5\text{nF}/\text{cm}^2$.

Applicants respectfully submit that Hara et al. does not describe a liquid crystal with a spontaneous polarization of less than $10\text{nC}/\text{cm}^2$. Applicants also respectfully submit that Hara et al. does not describe liquid crystal with spontaneous polarization of less than $10\text{nC}/\text{cm}^2$ in combination with a unit storage capacitance in a range of $1\text{nF}/\text{cm}^2$ to $4.5\text{nF}/\text{cm}^2$. Furthermore, Applicants respectfully submit that there is no suggestion in Hara et al. for a liquid crystal to have a spontaneous polarization in a range of $2\text{nC}/\text{cm}^2$ to $10\text{nC}/\text{cm}^2$ together with a unit storage capacitance in a range of $1\text{nF}/\text{cm}^2$ to $4.5\text{nF}/\text{cm}^2$. In addition, Applicants respectfully submit that the spontaneous polarization in Examples 1, 3 and 10 of Hara et al. are respectively $200\text{nC}/\text{cm}^2$, $110\text{nC}/\text{cm}^2$ and $240\text{nC}/\text{cm}^2$, rather than $20\text{nC}/\text{cm}^2$, $11\text{nC}/\text{cm}^2$ and $24\text{nC}/\text{cm}^2$ as suggested by the

Examiner. Thus, Hara et al. fails to describe or suggest each and every feature or the combination of features recited in independent claim 1, as amended. Accordingly, Applicants respectfully request that the 35 U.S.C. § 102(e) rejection of claim 1 be withdrawn.

All Claims Comply with 35 U.S.C. § 103

Claim 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida et al. This rejection is respectfully traversed on the basis that Yoshida et al. neither describes nor suggests the novel combination of features recited in independent claim 4. For example, claim 4 recites, amongst other features, that the smectic liquid crystal has spontaneous polarization in a range of 70nC/cm^2 to 100nC/cm^2 and a unit storage capacitance in a range of 5nF/cm^2 to 13nF/cm^2 .

In contrast, Yoshida et al. discloses a liquid crystal having a spontaneous polarization of 91.2nC/cm^2 at column 25, line 60. Further, Yoshida et al. discloses that the device of Yoshida et al. has a storage capacitance with a range of $.217\text{pF}$ to 3.91pF . Note that Yoshida et al. at column 26, line 2 of Yoshida et al. that the capacitance range of $.217\text{pF}$ to 3.91pF resulting varying the storage electrode area. The unit storage capacitance of Yoshida et al. can be determined by dividing the unit storage capacitance ($.000217\text{nF} \sim .00391\text{nf}$) by the area ($S/20 \sim .9S$ or $\{3 \times 10^{-4} \text{ cm}^2 / 20 \sim 0.9 \times 3 \times 10^{-4} \text{ cm}^2\}$) which yields a unit storage capacitance of about 14.4nF/cm^2 for both the low case of $S/20$ where capacitance is $.217\text{pf}$ and $.9S$ where capacitance is 3.91pf .

Applicants respectfully submit that the calculations at page 3 of the Office Action did not take into account the that range of S ($S/20 \sim .9S$) varies proportionally to the range of capacitance ($.217\text{pF}$ to 3.91pF) disclosed at column 26, line 1 of Yoshida et al. This assessment

is believed to be further supported by the fact that 3.91pF is about eighteen times greater than .217pF, which corresponds to .9S being about eighteen times greater than S/20. In other words, the capacitances disclosed by Yoshida et al. increase proportionally to an increase in an area of capacitance.

For these reasons, Applicants respectfully assert that Yoshida et al. does not describe or suggest a unit storage capacitance in a range of 5nF/cm² to 13nF/cm². Applicants also respectfully submit that Yoshida et al. does not describe or suggest a smectic liquid crystal having spontaneous polarization in a range of 70nC/cm² to 100nC/cm² together with a unit storage capacitance in a range of 5nF/cm² to 13nF/cm². Accordingly, Applicants respectfully request that the 35 U.S.C. § 103 rejection of claim 4 be withdrawn.

New Claim 5 is Patentable

Applicants respectfully submit that new claim 5 is at least allowable because none of the prior art of record describes or suggests smectic liquid crystal having spontaneous polarization in a range of 10nC/cm² to 70nC/cm² together with a unit storage capacitance in a range of 4nF/cm² to 7nF/cm².

CONCLUSION

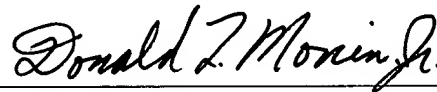
In view of the foregoing, withdrawal of the rejections and allowance of the pending claims are earnestly solicited. Should there remain any questions or comments regarding this response or the application in general, the Examiner is urged to contact the undersigned at the number listed below.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

MORGAN, LEWIS & BOCKIUS LLP

By:



Donald L. Monin, Jr.

Registration No. 47,256

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Customer No.: 009629

MORGAN, LEWIS & BOCKIUS LLP

1111 Pennsylvania Avenue, N.W.

Washington, D.C. 20004

Telephone: 202.739.3000

Facsimile: 202.739.3001